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ABSTRACT

In no previous period has there been the emphasis placed on guidance and understanding of the individual's needs and capabilities as there is today. This document was prepared to identify the guidance function of industrial arts and present information that will assist the teacher in this area of the program. Guidance in industrial arts provides educational, social, and occupational information and meaningful tryout activities for children, youth, and adults in an effort to help them assume self-directive attitudes. Topics on which information is provided include: (1) the school guidance program, (2) teacher involvement, (3) guidance material selection, (4) occupational education, (5) studying occupations, and (6) career guidance techniques. Selected bibliographical references provide additional data on guidance and its function. (Author/SN)

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GUIDANCE IN INDUSTRIAL ARTS EDUCATION FOR THE '70s

AMERICAN COUNCIL OF INDUSTRIAL ARTS SUPERVISORS

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Guidance in Industrial Arts Education... for the '70s

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"Teaching is regarded as inseparable from guidance; the teacher guides as well as teaches."

Guidance in the Curriculum, Association for Supervision and Curriculum Development

Introduction. Guidance in schools is an American phenomenon. No other country in the world devotes so much attention to the individual. Schools in all societies are concerned with the transmission of cultural heritages and with the socialization of youth. But in the United States there is an additional emphasis on the individual and on his needs and desires.

At the turn of this century, the school was simple; its curriculum consisted of the Three R's, and each subject prepared people for simple living. In contrast, today's school increasingly emphasizes not the simple life of work and family but preparation for effective living in a more complex society.

Today, the school helps students develop basic citizenship beliefs and skills; promotes the individual student's unique abilities; and trains persons to fill the nation's agricultural, business, governmental, industrial and professional needs.

In an era when full utilization of all talents is essential to the nation's future well being, industrial arts teachers, supervisors and teacher educators have become increasingly aware of the dual role their subject field plays in providing both instruction and guidance.

Industrial arts, as an integral part of the total program of education from kindergarten through higher education, offers distinct opportunities for each student to acquire educational, social and occupational information and to engage in meaningful activities that will assist him in choosing and planning a career.

The purpose of *Guidance in Industrial Arts Education* is to identify the guidance function of industrial arts and to present information that will assist the teacher in this phase of the educational program.

I. *Guidance functions.* Guidance in industrial arts provides educational, social and occupational information and meaningful tryout activities for children, youth and adults that serve as the basis upon which these students can assume responsibility for their self-direction. While this guidance function is not the exclusive responsibility of industrial arts, this subject field is rich in opportunities to initiate many of the guidance functions of the school's educational program. Through these guidance functions, the students:

Identify and resolve problems relating to their educational underachievement and deficiencies.

Maintain educational achievement and progress which are consistent with their aptitudes, abilities and interests.

Select courses which are consistent with their aptitudes, abilities, achievements, interests and goals.

Identify study habits and skills which will lead to their optimum individual learning.

Understand school offerings, graduation requirements, opportunities and requirements for post-high school education, and opportunities and means for financing future education.

Demonstrate moral values and their ability to be concerned for others.

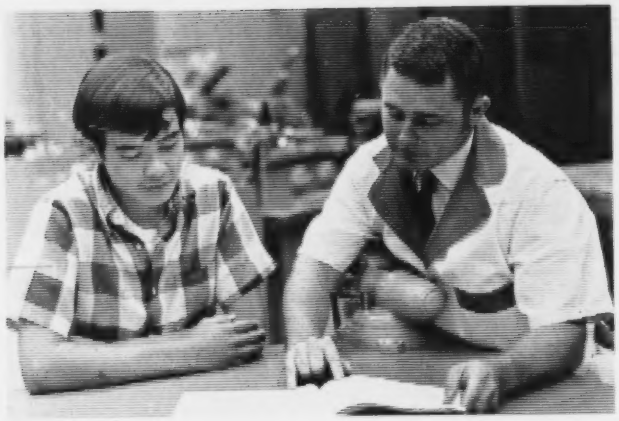
Identify and solve the problems of interpersonal relations as they arise in their daily experiences.

Understand themselves and accept the responsibility for making use of this understanding.

Show an understanding of the relationships between educational and occupational requirements and make wise choices of courses based on this understanding.

Develop positive attitudes toward occupational goals which are commensurate with their abilities and interests.

Select educational-occupational goals which consider current and future opportunities, requirements and personal qualifications.



II. *School guidance program.* An effective school guidance program is dependent upon the active participation of the teachers, administrators and counselors. Each shares a part in the performance of the total program. A team spirit prevails, with everyone conducting his phase of the guidance program.

An analysis of the various definitions of guidance indicates that there are two major concepts of guidance: (1) an inclusive concept which holds that all of education must help individuals become adequate, effective, healthy and happy adults; and (2) a sharply-focused concept of guidance as a pattern of specialized services.

In most school systems, a purpose is present in every facet of school life, every class and every activity for helping students toward full realization of every potential for success and happiness which they possess. Consequently, all teachers are responsible for providing educational, social and occupational information as well as for counseling. In other systems, however, counseling is organized as the sole responsibility of the guidance department. Only the trained counselors of that department make any planned effort to give help to individuals.

The goal of guidance in the school, like the general goal of education, is the development of mature, productive,

self-reliant and happy people. The basic principle of guidance is to give each individual whatever help he needs to achieve success and happiness. To achieve this purpose, a series of guidance services must be provided. In schools embracing the inclusive concept of guidance, these special services are conducted by the whole educational team: some by teachers, some by administrators and some by counselors.

It is difficult to predict what kind of world tomorrow will bring. The striking features of contemporary life are the explosive rate of technological change and the increasing complexity of our social organization. With technological developments continually creating new jobs and rendering old ones obsolete, it becomes virtually impossible to predict the specific job a student in school today may be called upon to perform during his working adult life. This mushrooming multiplicity of pursuits from which one may choose has the further complication that many occupations are characterized by a preconceived or stereotyped image instead of by a set of realistic facts. The nature and functions of an occupation are not readily apparent to those not engaged in it. For example, many students selecting engineering for a career really do not understand in advance the functions actually performed by an engineer, let alone the social problems and psychological factors that delineate the specifications of this profession. Young people frequently have only a hazy notion of what a design draftsman, tool and die maker, printer, patternmaker or electronics technician does during his working day.

The educational challenge is clear. Teachers, administrators and counselors cannot and should not make career decisions for students. It is, however, the responsibility of educators to provide varied and realistic information and experiences which will help students develop their potentialities and plan wisely in light of all the knowledge that can be mustered about themselves and the world in which they will live and work. The whole educational team must provide a well-defined program of guidance with built-in procedures for continuous and systematic appraisal of student abilities, interests and values. Career decision is a long-term developmental process.

III. *Teacher involvement*. There are many goals and objectives for teaching, and there are many definitions of teaching. For example, teaching has been defined as "the guidance of learning", "helping in the process of more complete self-realization", and "a way of changing behavior". Counseling also can be said to be all these things. In both teaching and counseling, the aim is to bring about changes in the behavior of individuals. Both the teacher and the counselor are involved in the total educational process.

A successful guidance program is dependent upon the close working relationship among teachers, administrators and counselors. To provide this teamwork, each assumes his share of the responsibilities. The industrial arts teacher makes many distinct contributions to the school's guidance program.

The industrial arts teacher works with the counselors and other teachers in appraising the interests and abilities of his students. In his classroom or shop/laboratory, the industrial arts teacher establishes the proper guidance climate by having a resource library that provides information concerning the occupations and professions related to his instructional area. Formally and informally he relates the work done by his students in the shop/laboratory to that done in industrial and technical occupations.

As a member of the school's total guidance program, the industrial arts teacher contributes resource material to the library and other classes, provides current information on occupations and professions relating to industrial-technical fields, participates in case conferences, assists in career fairs and conducts field trips.

The knowledge and skills utilized in industrial arts courses are related to a wide range of industrial-technical occupations and professions. Industrial arts courses contribute to the guidance function of the school by presenting information about a wide variety of industrial-technical occupations and professions; by providing hands-on experiences with the tools, materials and processes used in these pursuits; and by creating opportunities for students to appraise their abilities and interests in these areas.

IV. *Guidance material selection.* The problem of selecting guidance materials that provide suitable educational, social or occupational information is a challenging one. Films and publications become dated, and many of them do not depict exactly what should be presented. Unfortunately, the number and choice of educational media which deal with occupations and professions are not too plentiful. There are hundreds of pamphlets and books from which to choose; but they must be chosen with care. Many of these publications have limited usefulness as a result of biased viewpoints, inaccuracies and other weaknesses.

Standards for the preparation and evaluation of educational, social and occupational guidance materials have been developed by national associations in the field of counseling and guidance, such as the National Vocational Guidance Association. However, there are publishers and filmmakers who ignore these standards because of personal interests in promoting certain points of view or occupations. For this reason, guidance material must be carefully selected.

In evaluating and selecting materials for use in the school's total guidance program or in the part industrial arts plays in this program, many additional factors must be considered.

The materials to be used must be evaluated according to

the interests, maturity and experience of the students to whom they are going to be presented.

The origin and purpose of the guidance material must be clear. The names of persons or organizations responsible for preparation and distribution, as well as the qualifications of the authors or producers in the field they are covering, must be readily available.

Relatively current material is essential because of the constant changes in data and outlooks. Dates of the original preparation and subsequent revisions provide a key to the value of certain information.

To insure student interest and appeal in printed guidance material, the style and format are as important as the content. A format that is pleasing and attractive, through the use of color and appealing typography, invites reading. Up-to-date illustrations assist students in their perception of the activities and settings covered in the material.

More extensive publications require, for comprehensive use, a table of contents, a bibliography and a listing of sources of books, pamphlets, trade and professional journals, motion pictures, slides and other visual aids provided by government agencies, associations, industries, schools, colleges and universities.

The better guidance materials clearly identify the setting of each occupation: local, regional or national. They include both the social and economic aspects of the occupation, such as estimated annual employment figures and annual openings, as well as availability for both males and females and their working relationships within the occupation. The working environment is clearly depicted. For example, a machinist may work alone in a quiet, clean research laboratory or in a noisy plant in close proximity with many others. He may be engaged in highly accurate work or he may be involved with production methods that do not require close tolerances. It is essential that the broadest variety of work settings be realistically portrayed.

Guidance information will vary with the intended use. For example, information intended for adults considering retraining or additional education and training requires more specific information about earnings and fringe benefits than information designed to orient students to a wide variety of occupations and professions.

An industrial arts teacher must evaluate the guidance material to make sure it contains the necessary information for his own particular use. When he provides information about an occupation, the definition determined by the United States Employment Service should be used. The teacher

or the guidance material should explain the history and development of the occupation and its social and economic contributions.

The description of the occupation must also cover the nature of the work, duties performed, tools and equipment used, and the relationships to other persons, occupations and work settings. For example, the electronics industry produces devices, equipment and material for government, industry and home-community use; functions through the efforts of professional, semiprofessional, skilled and semiskilled workers; makes use of managerial, research, supervisory, production-worker, promotional, sales and distribution talents; and relates to many other industries.

Almost all occupations have specific requirements that must be met. These requirements involve education, training, temperaments and physical capacities. There are also requirements which are imposed by law or official organizations, such as licensure and certification. Within the framework of these requirements, there are various standards for the different levels of employment within an occupation.

In addition to the educational-training requirements that must be met in order to obtain employment in a selected occupation, there are usually certain preliminary steps that must be taken. In seeking employment, a person may apply directly, be referred by a friend, or use the assistance offered by unions, employers, professional organizations, public and private employment agencies, or school and college placement offices. The prospective employee may be required to take a written examination, a physical examination and/or a performance test. Through guidance material or through information provided by the industrial arts teacher, the requirements of various occupations and preliminary steps necessary in seeking employment should be made clear to the students.

Beyond the educational and training requirements and the employment opportunities available, the more mature students are concerned about advancement, employment stability and earning capacity in a given occupation.

Worthwhile guidance information indicates possibilities for advancement within an occupation. It sets forth the avenues of advancement through further education, further skill training, experience or tenure, seniority, examination or a combination of these factors. This information also provides an employment outlook for the years ahead and covers the many factors that may affect employment opportunities, such as, geographic location, age, sex, race, physical disabilities, supply and demand, training programs, automation and other technological developments.

One of the more important points covered in this information that has special interest for the older students is the earning potential for the employee in a selected occupation. Information is provided concerning both beginning and average wage or salary according to setting, locality and other significant factors. Aside from the base salary, there may be supplementary income and fringe benefits, such as, commissions, tips, overtime, bonuses, transportation, meals, housing, hospitalization, vacations, insurance and retirement plans. Related to earnings are costs or deductions for tools, equipment, uniforms, supplies, union and association dues and similar items, which should be considered when studying the total picture of income.

The guidance function of industrial arts is served by information that compares occupations. There are many conditions of work with implications for the individual's way of life. Some include daily and weekly time schedules, shift work, overtime and seasonality. Others relate to physical conditions, such as, required travel, indoor or outdoor activity, extreme noise conditions, extreme temperature conditions and health hazards.

Finally, there are social and psychological factors that must be recognized. There are usually certain distinguishable work satisfactions and patterns of relationships with employers and co workers. There may be the requirement or desirability on the part of the employee to be associated with unions, associations or other organizations within an occupation or profession.

V. *Occupational orientation.* The world of work, with its endless and ever-changing variety of occupations, holds a special fascination for children and youth. Pupils in elementary schools are naturally curious about all phenomena in their environment and are eager to learn of the many ways man goes about his work. Students in secondary schools are searching for their roles in the world of work they will soon enter. More conscious of social and economic considerations, they seek careers or occupations in keeping with their interests and abilities.

Opportunities for educational, social and occupational guidance exist at all levels of education and in all areas of the curriculum. Many educators consider this guidance function is best integrated in the total instructional program rather than introduced as a separate unit. Through the use of a variety of specifically planned information lessons and materials, a continuous investigation of occupations and professions is conducted in each grade. These materials are geared to the interests, maturity and experience of students at each grade level. Information provided at the elementary school level is general in nature, while that at the secondary school level is more specific.

The methods by which occupational information is introduced are limited only by the ingenuity of the teacher. Guidance materials, such as booklets, brochures, occupational briefs and audio-visual tapes, are available for use by the teacher. The industrial arts teacher can enhance his guidance activities by developing a guidance material center in which occupational information related to industry and technology is featured. Such a center should be developed cooperatively with the school guidance department.

In elementary schools, the natural curiosity of children generates many questions about work and different occupations and professions that should be answered. Young children may not comprehend all the effects work may have on their own lives, but they can understand many aspects of career information. They can perceive how a person's occupation can affect his place of residence, the clothes he wears, and the hours he works. As children grow older, they are more able to comprehend the importance of work and the contributions made by workers of all types.

Elementary school industrial arts calls attention to a great variety of occupations related to construction, manufacturing, processing, power, transportation and communication. Instruction in the social sciences is particularly adaptable to enrichment through the use of information about careers. Such a program divides naturally into two classifications: the early elementary (kindergarten and grades one through three), in which the child is concerned with work in the familiar surroundings of home and community, and the later elementary (grades four through six), in which the child's concept of work expands to include his state, nation and neighboring countries.

Industrial arts hands-on activities help children acquire basic skills by using tools and materials. Good work habits are developed by working with others and following through a task to completion.

It is in the elementary school where the development of positive attitudes toward work begins. The employability of individuals is largely dependent upon such attitudes as the desire to work, responsibility, dependability, adaptability, loyalty, respect for the dignity of all kinds of work, pride in accomplishment, cooperation and appreciation of quality in workmanship.

The work that children do in their assignments and school activities has a relationship to the work performed by adults in a wide range of occupations. The attitudes developed by students toward school work relate directly to their future work as employees, professionals, managerial personnel or entrepreneurs. The manner in which the teacher presents assignments, assists his students while doing them, and evaluates the work when completed has a great deal to do with attitude development. For example, if the teacher calls attention only to that which the student has *not* performed well, and fails to reward him for his achievements, the student's desire to work will be negatively affected. Understanding of concepts and attitudes common to all work that are formed at this level may be held permanently. The teacher plays a vital role in the development of work habits and attitudes that will be advantageous to the individual in his adult life.

The exploratory nature of the industrial arts curriculum in junior high school or middle school programs provides an ideal setting for offering educational, social and occupational information. Through study and experiences involving the use of a variety of tools, machines, instruments, materials and processes, students are given opportunity to plan, experiment and work in areas relating to many industrial-technical fields. Through these practical experiences, students can more wisely assess and understand their interests, abilities, limitations and potentialities relating to industrial-technical pursuits.

In most instances, industrial arts instruction at this level is conducted by a teacher specially prepared in the field of industrial arts. This is advantageous to the student. As a result of his experience and education, the industrial arts teacher provides more realistic and current occupational information concerning a broad range of industrial-technical occupations and professions. He also offers help to the student in assessing his potential for success in various occupational fields. Although it is too early for the student to make a wise choice of an occupation, his growing curiosity about himself and his environment leads to a more realistic appraisal of his skills, interests and knowledge. He begins to recognize that the independence he seeks can be satisfied by the acquisition of knowledge and skills.

Again, the previously-stated attitudes necessary for employability must be developed. However, the approach to their development must be indirect and subtle, for this kind of attitude grows only from experience. When the results of dependability, loyalty or cooperation can be compared to the lack of them, young people are more likely to subscribe to them.

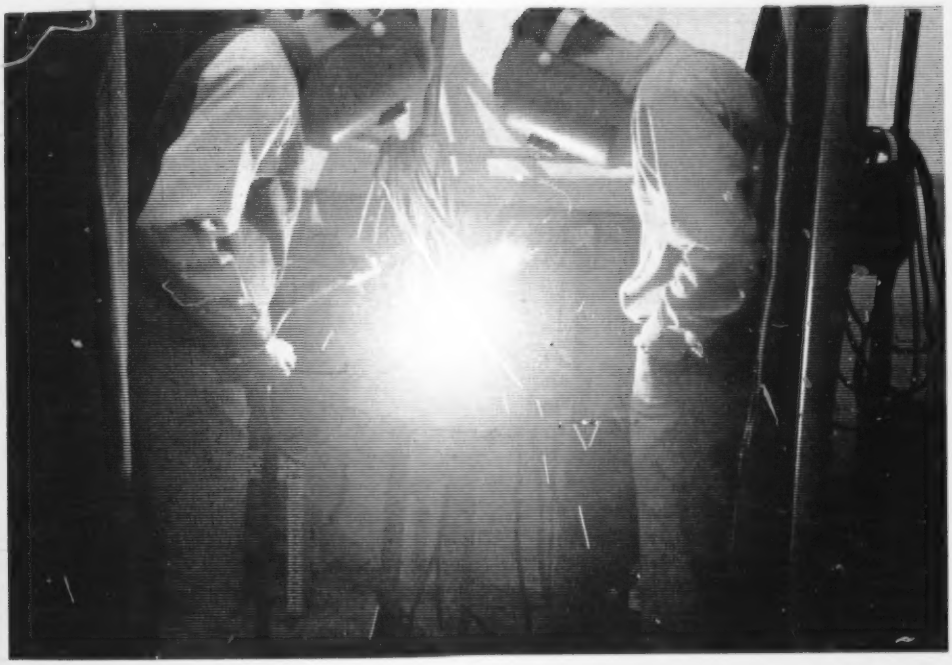
The guidance function at the junior high school level includes information helpful to students in planning their high school educational program. The requirements for entry into various occupational fields, as well as the factors to be considered in choosing a career, are also covered. Here, as at all levels of education, students need information which will help them formulate career goals based upon their growing knowledge of themselves.

The accumulated experience and maturity of high school students make them more ready to identify with certain occupational areas. Whereas the individual has, since elementary school, been eliminating various occupational choices as his self-concept changes, he is now beginning to take a more positive look at certain occupations. This is not to say he is ready to make a valid occupational decision. On the contrary, research indicates a majority of individuals do not actually enter occupations selected while in high school. However, through the acquiring of knowledge and skills, he finds that he can more wisely focus on certain educational and occupational goals.

The industrial arts teacher makes a unique contribution to both the educational and guidance programs of the school by providing opportunity for students to acquire knowledge, skills and occupational information relating to industrial-technical fields. At this level, guidance information concerning educational and training requirements, working conditions, personal qualifications, responsibilities of workers and job opportunities becomes more specific.

Frequent scheduling of resource people from a variety of occupations and professions to speak to the industrial arts students enriches the guidance function of the program: governmental employment service personnel can provide current information about job opportunities and requirements; union representatives can explain the apprenticeship programs; and representatives from community colleges and colleges/universities, as well as practitioners—such as technicians, architects, engineers, scientists and industrial arts educators—can offer first-hand information concerning careers requiring post-high school preparation.

The industrial arts teacher is a member of the guidance team which includes counselors, administrators and the teachers in the other subject fields. Each has a function in the total guidance program arising from his area of specialization. Each has a responsibility to work with the other in helping each student gain the insight and knowledge required for realistic career selection.



VI. *Studying occupations.* With the thousands of different occupations and professions in the United States from which to select, it is obvious that a thorough study of every type of employment cannot be made. Even to study those related to the areas of industrial arts education presents a formidable task. It is quite important, however, that a student become familiar with a wide variety of career fields.

An excellent opportunity for students to acquire knowledge about occupations and professions is provided by the broad philosophy and program of industrial arts in its study of industry and technology. Occupational guidance is a natural part of industrial arts instruction. Students can make wise career decisions when occupational information is meaningfully correlated with the activities and other learning experiences provided in the industrial arts programs in the elementary and secondary schools.

Teachers are cautioned against having students study about occupations separately or in unrelated lessons. Occupational information is best assimilated and most meaningful when it is an integral part of the instructional program. Because occupational choices are made through a developmental process, occupational information and tryout experiences must be sequential and related.

Guidelines are necessary in making the study of selected occupations and professions productive. The industrial arts teacher must plan the guidance phase of the instructional program so that the students become familiar with the general classifications of industries and occupations as well as with the specific requirements of certain occupations.

The first step in providing information about occupations is for the teacher to introduce an overall or general classification

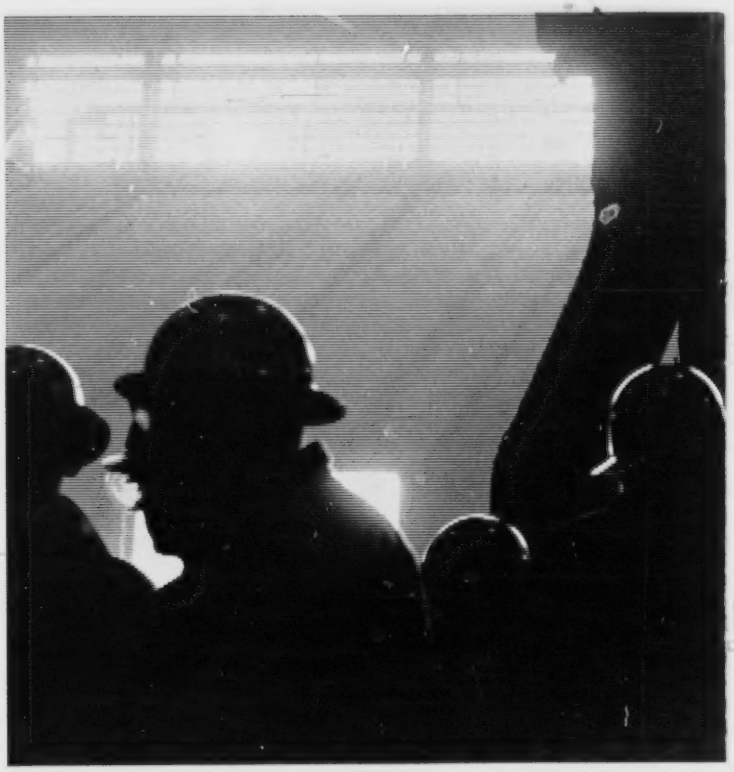
of industries and the number of workers employed in each of these industries. Most sources classify industries by the following categories: (1) manufacturing, (2) trade: wholesale and retail, (3) government, (4) services, (5) agriculture, (6) transportation, (7) construction, (8) finance and (9) mining.

The second step is to present the classification of occupations within these industries. For this, the information provided by the US Department of Labor is most generally used. Occupations are grouped as professional and technical, managers and proprietors, craftsmen and foremen, semiskilled and operatives, clerical, service, unskilled and farm workers.

The third step is to present information about individual or related families of jobs. The following points are presented to serve as a guide for offering specific information concerning each occupation or profession covered in the instructional program:

(1) Nature of the occupation: activities, duties and responsibilities of the worker and restrictions relating to age, sex and physical requirements. (2) Employment trends in the occupation: stabilized, declining or expanding; restricted to certain geographical regions; and opportunities for advancement. (3) Personal requirements: social and leadership qualities and creative ability. (4) Educational and training qualifications: professional, technical and/or general education; level of education—high school, technical school or college; certification, licensing, apprenticeship or internship; and length and cost of education and/or training. (5) Working conditions: hours of work; where work is done; seasonal; sitting, standing, walking or traveling; surroundings; hazards; type of supervision; working in groups or alone; and supervising responsibilities. (6) Economic returns: beginning salary or wage and rate of increases; possibilities for promotion; degree of security; and vacations, sick leave and retirement. (7) Related fields that may be entered: with or without additional training or preparation and ease with which change can be made.

By studying about occupations and professions within the industrial arts instructional program, students gain a broader knowledge of careers, develop a feeling of stability and security about their future, make wiser decisions about further education and training, facilitate their career choices, and understand the economic necessity of satisfying employment as adults.



VII. *Career guidance techniques.* There are many methods used in presenting occupational information and career guidance within the industrial arts program. An imaginative teacher makes use of a variety of techniques designed for the particular age group involved. Because the school guidance counselor will also be using various techniques of guidance, the industrial arts teachers should concentrate on techniques and procedures which are closely related to the regular classroom or shop/laboratory learning activities.

Following are some ideas used in presenting career information:

(1) Industrial tours give students an opportunity to see, hear, feel and smell the environment. Machines being used and jobs performed are compared with those encountered in the industrial arts shop/laboratory. Students acquire a better understanding of the psychological and sociological aspects of various occupations. These are often more important to success on a job than specific tool skills.

(2) Class discussion and instruction related to the various occupations and professions make it possible for (a) the industrial arts teacher to cover careers pertaining to the subject content being taught at that time in the course; (b) the guidance counselor to acquaint students with the various sources of occupational information and the related school courses which may be taken; and (c) resource people from the community to present specific information and the relationships of various occupations and professions in the region.

(3) Student reports concerning the results of investigations of occupations carried out by individuals or by teams provide additional instruction. Group discussions conducted after the reports have been given help clarify and develop understanding about the various aspects of the types of jobs being studied.

(4) Job surveys of the community help students become aware of employment opportunities in their own locality. Students learn to classify and organize information concerning job characteristics through this experience.

(5) Educational media presentations which make use of video tape equipment, tape recorders, film projectors and charts serve as a means of arousing student interest in occupational goals.

(6) Resource centers for independent study in which books, pamphlets, films, tapes and periodicals are catalogued provide opportunity for students to locate easily any information concerning the career they wish to study.

(7) Occupational notebooks assist students in compiling individual profiles. Material included in the notebook is personally related to the student preparing it. This helps him select and concentrate on careers which interest him. He becomes aware of his strengths, interests and abilities as they relate to realistic and potential career goals.

(8) Records kept by the industrial arts teacher, which may be used in cooperation with the guidance counselor, set forth each student's work habits, aptitudes, work experiences and other attributes which may have career guidance significance.

Selected guidance information sources.

The agencies and associations listed in this section will provide, upon request, publications presenting information about occupations and professions specifically related to their fields.

In starting a collection of guidance materials, one of the best sources of information that is readily adaptable to industrial arts classroom or shop/laboratory use is the *Occupational Outlook Handbook* (US Department of Labor, Bureau of Labor Statistics, Washington, DC), which may be purchased from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402. Other highly-recommended books are: *Occupational Information: The Dynamics of Its Nature and Use* (Max F. Baer and Edward C. Roeber, Science Research Associates, Inc., Chicago); *Career Information in Counseling and Teaching* (James B. Conant, McGraw-Hill Book Company, New York); *Careers in Fact and Fiction* (New York State Department of Education, Bureau of Guidance, Albany, New York 12203); *Dictionary of Personnel and Guidance Terms* (William E. Hopke, Editor, J. G. Ferguson Publishing Co., Chicago, 1968); *Guidance in the Curriculum* (Association for Supervision and Curriculum Development, Washington, DC, 1955); and *Pupil Personnel Services in the Modern School* (Dugald S. Arbuckle, Allyn and Bacon, Inc., Boston, 1967).

Selected sources

Industry, agencies and associations

Aerospace
- Aircraft Industries Association, 15th and H Sts., NW, Washington, DC 20001.
- American Institute of Aeronautics and Astronautics, Inc., 1290 Avenue of the Americas, New York, NY 10019.
- Institute of the Aeronautical Sciences, 2 E. 64th St., New York, NY 10021.
- National Aerospace Education Council, Suite 616, Shoreham Bldg., 806 Fifteenth St., NW, Washington, DC 20005.
- Public Relations, Air Transport Association of America, 1000 Connecticut Ave., NW, Washington, DC 20036.

Automotive
- Allis-Chalmers Manufacturing Co., Public Relations Division, PO Box 512, Milwaukee, Wis. 53201.
- American Institute of Mining, Metallurgical and Petroleum Engineers, 345 E. 47th St., New York, NY 10017.
- American Petroleum Institute, 1625 K St., NW, Washington, DC 20006.
- American Trucking Association, 1616 P St., NW, Washington, DC 20036.
- Arabian-American Oil Co., 505 Park Ave., New York, NY 10022.
- Association of American Railroads, Transportation Bldg., Washington, DC 20006.
- Automobile Manufacturers Association, 320 New Center Bldg., Detroit, Mich. 48202.

General Motors, Education Department, Mound Road and 13 Mile, Detroit, Mich. 48202.
Shell Oil Co., 50 W. 50th St., New York, NY 10020.
Standard Oil Co. of New Jersey, 30 Rockefeller Plaza, New York, NY 10020.

Drafting
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American Congress on Surveying and Mapping, Woodward Bldg., Washington, DC 20005.
American Institute of Architects, 1735 New York Ave., NW, Washington, DC 20006.
American Institute of Industrial Engineers, 345 East 47th St., New York, NY 10017.
American Society for Oceanographers, 906 C and I Bldg., Houston, Texas 77002.
American Society of Civil Engineers, 345 E. 47th St., New York, NY 10017.
American Society of Landscape Architects, Inc., 2000 K St., NW, Washington, DC 20006.
American Society of Photogrametry, 105 N. Virginia Ave., Falls Church, Va. 22044.
Cartoonists Society, 247 W. 43rd St., New York, NY 10036.
Engineers Council for Professional Development, 345 E. 47th St., New York, NY 10017.
Industrial Designers Society of America, 60 W. 55th St., New York, NY 10019.
National Oceanographic Association, 1900 L St., N W, Washington, DC 20036
National Society of Interior Designers, Inc., Suite 700, 157 W. 57th St., New York, NY 10019.

Electrical/Electronics
American Institute of Electrical Engineers, 345 E. 47th St., New York, NY 10017.
American Registry of Radiological Technologists, 2600 Wayzata Bend, Minneapolis, Minn. 55405.
American Women in Radio and Television, Inc., 75 E. 55th St., New York, NY 10022.
Institute of Radio Engineers, 1 E. 79th St., New York, NY 10021.
International Brotherhood of Electrical Workers, 1200–15th St., NW, Washington, DC 20005.
National Association of Radio and Television Broadcasters, 1771 N St., NW, Washington, DC 20036.
National Electrical Contractors Association, 1730 Rhode Island Ave., NW, Washington, DC 20036.
National Joint Apprenticeship and Training Committee for the Electrical Industry, 1730 Rhode Island Ave., NW, Washington, DC 20036.
Thomas Alva Edison Foundation, Inc., West Orange, NJ 07052.

Graphic Arts
Printing Industry of America, Inc., 20 Chevy Chase Circle, NW, Washington, DC 20015.
Professional Photographers of America, Inc., 1090 Executive Way, Oak Leaf Commons, Des Plaines, Ill. 60018, and 151 W. Wisconsin Ave., Milwaukee, Wis. 53203.

Metals

American Astronomical Society, 211 Fitz Randolph Road, Princeton, NJ 08540.

American Geological Institute, 1444 N St., NW, Washington, DC 20005.

American Iron and Steel Institute, 150 E. 42nd St., New York, NY 10017.

American Meteorological Society, 45 Beacon St., Boston, Mass. 02108.

American Optometric Association, 4030 Chouteau Ave., St. Louis, Mo. 63110.

American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 345 E. 47th St., New York, NY 10017.

American Society of Mechanical Engineers, 345 E. 47th St., New York, NY 10017.

American Welding Society, 345 E. 47th St., New York, NY 10017.

Association of American Geographers, 1146 Sixteenth St., NW, Washington, DC 20036.

Forging Industry Association, 55 Public Square, Cleveland, Ohio 44113.

International Association of Machinists, 1300 Connecticut Ave., NW, Washington, DC 20036.

National Association of Manufacturers, 2 E. 48th St., New York, NY 10017.

National Coal Association, Educational Director, Washington, DC 20036.

National Tool, Die and Precision Machinery Manufacturers Association, 907 Public Square Bldg., Cleveland, Ohio 44113.

Sheet Metal and Air Conditioning Contractors National Association, Inc., 107 Center St., Elgin, Ill. 60120.

United Association of Journeymen, Apprentices, of Plumbing and Pipe Fitting Industries, 901 Massachusetts Ave., NW, Washington, DC 20001.

Woods/Construction

American Federation of Labor, Congress of Industrial Organizations, Building and Construction Trades Dept., 815 Sixteenth St., NW, Washington, DC 20006.

American Institute of Interior Designers, 673 Fifth Ave., New York, NY 10022.

Archeology Institute of America, 100 Washington Square East, New York, NY 10003.

Associated General Contractors of America, Inc., 1957 E St., NW, Washington, DC 20006.

Botanical Society of America, Dept. of Botany, Indiana University, Bloomington, Ind. 47405.

Brotherhood of Painters, Decorators and Paperhangers of America, 217-219 N. Sixth St., Lafayette, Ind. 47091.

National Association of Home Builders, 1625 L St., NW, Washington, DC 20036.

National Association of Plumbing, Heating-Cooling Contractors, 1016 Twentieth St., NW, Washington, DC 20036.

National Association of Real Estate Boards, Department of Education, 36 S. Wabash Ave., Chicago, Ill. 60603.

National Paint, Varnish and Lacquer Association, 1500 Rhode Island Ave., NW, Washington, DC 20005.

National Roofing Contractors Association, 300 W. Washington St., Chicago, Ill. 60606.

Society of American Foresters, 1010 Sixteenth St., NW, Washington, DC 20006.

Structural Clay Products Institute, 1520 Eighteenth St., NW, Washington, DC 20036.

Governmental agencies and other agencies and associations.

American Dental Association, Council on Dental Education, 211 E. Chicago Ave., Chicago, Ill. 60611.

American Institute of Chemical Engineers, 345 E. 47th St., New York, NY 10017.

American Institute of Physics, 335 E. 45th St., New York, NY 10017.

American Mathematical Society, P O Box 6248, Providence, RI 02904.

American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610.

American Occupational Therapy Association, 250 W. 57th St., New York, NY 10019.

American Physical Therapy Association, 1790 Broadway, New York, NY 10019.

Chamber of Commerce of the United States, Washington, DC 20006.

Manufacturing Chemists Association, Inc., 1825 Connecticut Ave., NW, Washington, DC 20009.

Mathematical Association of America, University of Buffalo, Buffalo, NY 14214.

National Education Association, 1201 Sixteenth St., NW, Washington, DC 20036.

National Institute of Ceramic Engineers, 4055 N. High St., Columbus, Ohio 43214.

National Recreation and Parks Association, 1700 Pennsylvania Ave., NW, Washington, DC 20006.

President's Committee on the Employment of the Handicapped, Washington, DC 20210.

Retail Jewelers of America, Inc., 1025 Vermont Ave., NW, Washington, DC 20005.

Society of Industrial and Applied Mathematics, 33 S. Seventeenth St., Philadelphia, Pa. 19103.

Smithsonian Institute, Washington, DC 20560.

Society of the Plastics Industry, Inc., 250 Park Ave., New York, NY 10017.

Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

US Civil Service Commission, Washington, DC 20415.

US Department of Agriculture, Washington, DC 20250.

US Department of Commerce, Bureau of the Census, Washington, DC 20233.

US Department of Defense, Washington, DC 20301: US Air Force 20330, US Army 20310, US Coast Guard 20390, US Marine Corps 20380, and US Navy 20350.

US Department of Health, Education and Welfare, Washington, DC 20201: Office of Education, Guidance and Student Personnel Section 20202, and Public Health Service 20203.

US Department of Labor, Washington, DC 20210: Bureau of Apprenticeship 20212, Bureau of Labor Statistics 20212, US Employment Service 20211, and Women's Bureau 20210.

Veteran's Administration, Washington, DC 20420.

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